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THE JOURNAL OF INDUSTRIAL HYGIENE

AND ABSTRACT OF THE LITERATURE

OFFICIAL ORGAN OF
THE AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

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Annual Address of the President of the American Association of Industrial Physicians and Surgeons

The Relation of Industrial Medicine to the General Practice

Prevention, Rehabilitation, and Medicolegal Aspects of Sprained Back

Further Studies in Mental Hygiene in Industry: Malingering

Can Sick-Benefit Associations Profitably Engage in Disease Prevention Work?

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ANNUAL ADDRESS OF THE PRESIDENT OF THE AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS*

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MOST doctors talk to their patients, who are laymen, with freedom and facility. It is said that most doctors disagree, but this fact is no hindrance to discussion; on the contrary, colloquy is promoted thereby. When it came to my attention that the President's address was to be presented before a joint meeting comprising both doctors and laymen, I was profoundly moved by the gravity of precipitating discussion based on vague premise. Trepidation gave way, however, with the consciousness of the common purpose of this meeting, uniting, as it does, the two great agencies that have it within their power to bring physical satisfaction to the great productive group of our citizens during their active period and material contentment during their declining years. I shall not trespass upon the safety theme, but shall give the time alloted to the medico-socio-economic aspects of our relation to industrial life, and to certain discursive but relevant topics.

So tremendous have been the recent advances in medicine that one cannot grasp more than a small part of them; hence the general practitioner has become more or less dependent upon the skill and specialized training of physicians having adequate knowledge to treat the patient in accordance with the best scientific procedure. Even the layman realizes the futility of individual effort to attain the knowledge necessary in treating the simplest and most common maladies, because of the many complications which experience has shown are adherent possibilities of any disease. Medical treatment has always been in advance of knowledge, and exact knowledge of disease has come later from the results of efforts to palliate or cure the diseases of man. The medical profession has only of late recognized the great practical value of the labors of the physiologist, the physicist, and workers in other branches of science. The organ-

*Read before the joint meeting of the American Association of Industrial Physicians and Surgeons and the National Safety Council, in Buffalo, Oct. 2, 1923. Received for publication Oct. 5, 1923.

ization of departments of trained workers in special fields of medicine and allied sciences has aided greatly in obtaining information which permits an interpretation of all of the facts of the case by the diagnostician and brings knowledge closer to treatment.

Industrial medical practice has become a more or less specialized field embracing particularly traumatic surgery and personal hygiene, or, collectively, sanitation, commonly referred to as preventive medicine. These subjects are of secondary importance in the average general practice. It would be mutually helpful and would redound immeasurably to the advantage of the community as a whole if the interrelationship existing between medicine and industrial life were more fully understood and acted upon by the whole medical profession. This fact is to no small degree the reason for the existence of the physician in industry. Admittedly it is difficult to define his real function because of the great variety of his duties, which are determined by the administrative policies or exigencies of the particular business with which he is associated.

Some time ago the Conference Board of Physicians in Industry promulgated a definition which, while stiltedly expressed, seems to cover the subject, and is comprehensive and intelligent:

> The physician in industry is one who applies the principles of modern medicine and surgery to the industrial worker, sick or well, supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation and accident prevention, and who, in addition, has an adequate and co-operative appreciation of the social, economic and administrative problems and responsibilities of industry in its relation to society.

This definition has been buffeted about by destructive criticism, but as yet there has not appeared a better one. Hence I, at least for the present, accept it.

We are amazed at the development and practical use of the automobile, wireless telephony and telegraphy, aeronautics and modern inventions, but nothing approaches the miraculous so nearly as do the fifteen years of added life that have been given to American citizens by the application of life-saving methods through discoveries in medicine, biology, bacteriology, entomology, chemistry, and engineering in its various branches.

The great gain in life expectancy has occurred largely since 1870, at which time life expectancy was 41 years. In the sixteenth century the average length of human life was between 18 and 20 years; at the close of the eighteenth century it was less than 25 years; at the close of the nineteenth century it was between 45 and 48 years; whereas today it varies in different countries from less than 25 in India, where the average is only about 24 years, to 56 years in the United States, and 60 in New Zealand. The general mortality rate in the registration area of the United States has been reduced from 19.8 per thousand in 1880 to 11.6 in 1921. This means the saving of about 500,000 lives for the year 1921 alone. The death rate of the city of Buffalo was 24.06 per thousand in 1882, and 12.80 in 1922; thus the saving in human lives for the year 1922 was 5,630.

Consider for a moment, if you will, from the standpoint of present security, what would have been the situation if the death rate of the United States for last year had been that of the city of Buffalo for 1882; 1,309,000 more people would have died than did die. This, if expressed in terms of money value, would have meant a loss of $660,000,000 for the year. Notwithstanding the present seemingly satisfactory state, pre-

ventive medicine is far from having attained its possibilities. If the public would apply the present knowledge of preventive medicine, the average length of life could readily be extended to 65 years. Insurance statisticians anticipate an average of 75 years in the not remote future.

What is responsible for this social Golconda? There are three major factors: preventive medicine or public health service, modern surgery, and the safety movement. I also wish to state with the utmost confidence, notwithstanding the opposition which is being encountered at the present time, that prohibition has contributed and will continue to contribute its share.

The first of this group—public health service—includes the control or restriction of communicable diseases, the abatement of nuisances, the sanitary inspection of food supply, schools, public buildings, institutions and tenements, the collection and removal of refuse, the registration of vital statistics, the supervision of public and private water supplies, the collection and removal of sewage, the regulation of offensive trades, the control of infant mortality, and child hygiene. All of these subjects have many subdivisions, interdependencies, and ramifications.

Surgery as a science exerted little influence on human affairs until about a century ago—this with all respect to the thorough scientific studies of Galen, Vesalius, Paré, Harvey, Haller and the Hunters; but with the advent of Lister and Morton and the modern contributors to surgical pathology, physiology, diagnosis and operative technic, it has made great progress. Operative mortality has been reduced from appalling figures to 2 to 5 per cent. in general hospitals. Representative examples of procedures in which especial improvement has been made are the treatment of compound fractures and abdominal infections, of which appendicitis is an outstanding example, and the treatment of toxic goiter, a disease of major importance in the Great Lakes Basin, which formerly had an operative mortality of 15 to 20 per cent. but which now has a mortality of less than 1 per cent.

The problem of prolongation of life is a most engaging one, and has enlisted public interest from biblical times to the present day. Among the ancients search was made for some elixir of life, records of which appear throughout history. During the middle ages great value was attached to various concoctions and combinations of drugs, the employment of which was claimed to prolong life and prevent accidents. With the passing of centuries the tendency has been toward the scientific. Scientific knowledge is from a decade to a century in advance of its adaptation and practical utilization. Therefore, in the course of time there will appear returns from the social disease crusade, mental hygiene will be better understood, and the diseases of middle life, the results of "wear and tear," will be dealt with in simple fashion—namely, by means of the periodic health examination. There is no more valuable measure at our command for the early detection of diseases, especially those in which the onset is so insidious as to permit them to become well established or even fairly advanced before the victims are aware of their presence. In any extensive series of examinations of persons who consider themselves in good health, it is amazing how many defects which appear trivial in themselves but which are really potential morbidity producing factors of most serious import, and how many definite indications of serious disease are disclosed.

The time to prepare for old age is early in middle life. It is at this period that the individual should be so guided and directed that the disease process may be corrected or checked to such an extent that it will not interfere with his productive capacity or cause disability.

It is most striking that old employees, those in middle life, laborers or mechanics, who have held their positions twenty or thirty years or longer, are always physically better than floaters or relatively small time employees. Almost invariably there is a constant ratio between length of employment and physical soundness. These men are clean of mind and body, and neater in attire, however much they may be exposed to the grease and grime of manufacturing processes. They are provident or want to be; they have at least a small bank account, an equity in a home or a lot, Liberty Bonds or a small holding of sound securities. Their children have had high school training, and the family resources are strained to the limit in order that the children may have every available advantage. All this is, of course, to be expected of this fine group of men, whose very fineness makes them a tragic spectacle when overcome by premature disability. I have in mind a group of men pensioned a few years ago for physical disability. Their records are given in the accompanying tabulation.

Age	Years Employed	Occupation	Wages	Dependents	Cardiovascular Disability	Resources and Property
73	53	Asst. supt., master mechanic	Going rate	W—2 children	High blood pressure; senility; arteriosclerosis	$200
62	30	Carpenter process	Going rate	W—3 children	Emphysema; hemorrhoids	$900 equity
62	42	Laborer	Going rate	W—8 children	High blood pressure; senility	$60
42	21	Foreman	$250	W—2 children	Tuberculosis; mental	$3,500 equity
54	18	Mechanic, foreman	$220	W—6 children	Cardiovascular	1 Liberty Bond and small account
58	20	Laborer	Going rate	Sister	Senility	$150 Liberty Bond and small account
70	36	Laborer	Going rate	W—no children	Senility	Home valued at $1,800

It is and should be a large part of the responsibility of the physician in industry, if he discharges his duty to employed and employer alike, to see to it with the utmost militancy that the uninformed fellow-worker is directed to consult a specialist with regard to his ailments. I say this with a full recognition of the rights of the general practitioner.

Let us take as an illustration toxic goiter. In the Great Lakes Basin, Colorado, and the northwest states, where this malady is common, the surgeon gains experience in operation and judgment which has resulted in a perfected technic with a remarkably low death rate and almost no postoperative ailment or disability. In other districts in which the operation is only an occasional occurrence, the results seem to be less satisfactory than merely poor technic would warrant. It is therefore probable that there has been a neglect of certain details which have not impressed the occasional operator in this very important procedure. There are numerous details to be observed in preparing a patient for the surgical treat-

ment of goiter. In order that the surgical risk may be reduced to the lowest point, it is well worth the additional outlay in money and time for a patient contemplating such procedure to be placed in contact with a clinic offering the minimum risk.

The medical charlatan, the pure quack, the advertising faker, the osteopath, and the chiropractor find among wage-earners as fruitful a field as among any other financial or social group. Happily the wage-earner is not the ready victim of Christian Science for, as Dr. Mayo has said, "Not all persons have sufficient imagination to accept the Christian Science jumble. It takes real imagination to reach a hand in the air, bring it down empty and say 'See what I have in my empty hand.'"

As was admirably expressed by Dr. George Vincent, "the scope of modern medicine is as wide as the range of influences, whether physical, biological, mental or social." Social problems from their very nature compel the serious attention of the industrial physician. The only solution of social pathology as of physical pathology is an intelligent search for the cause and, when found, its eradication, and thus prevention.

It is trite for the doctor to say that the public must be educated when his own education is incomplete. Until recently, at least, organized medicine has made very little concerted effort to give the public guidance in its thought relating to socio-medical problems. Most of the study of recent years has been made and reported by lay organizations or by those promoted by laymen. To a large extent we lack the facts, which are obtained only as a result of careful analytical study by trained individuals.

At the International Congress of Social Workers which was held in Washington during the current year, it was disclosed that three-fourths of the poverty on this continent was traceable to physical and mental incapacity. Various commissions have been studying the problem of sickness and their findings show that in the United States three persons of every one hundred are constantly ill. This means:

1. In the United States and Canada 3,500,000 persons are ill practically every day in the year.

2. Twenty per cent. of the population suffer a week or more of illness during the course of one year. In other words, one person in every five should anticipate at least seven days of sickness every year.

3. On the basis of time lost every year by working people, each person in the United States and Canada loses seven days annually through illness, which means a total of 770,770,000 days every twelve months.

4. The average duration of illness is slightly more than thirty-five days.

5. Families of wage-earners in industrial centers spend $32 to $53 a year on account of sickness in addition to gratuitous care in public and private hospitals. Some small conception of this expenditure for hospital service may be had from the records of the city of New York, where it is estimated that $22,000,000 are expended annually on the care of the indigent. These figures in their national application assume stupendous proportions. It was further found that sickness was a problem in from 36 to 49 per cent. of the families under the care of the United Charities of Chicago. The Social Insurance Commission of California found sickness to be the primary cause of dependency in 50 per cent. of the families studied. The New Jersey Commission reported that it was the cause of dependency in 42 per cent. of a total of 1,412 families. Sick-

ness was present in two-thirds of 3,000 families assisted by the Charities Organization Society of New York City in 1916, and in 42 per cent. of the families under the care of the Philadelphia Society for Organized Charities during 1916.

Obviously, then, sickness and disability, which are in a large measure preventable, play the most important rôle in the production of poverty. This fact emphasizes the necessity for medical men and public health workers to keep in mind the significance of cause and effect.

A few years ago an investigation was made by the United States Public Health Service covering certain industries of the South. It was found that when the monthly income averaged less than $12 per person in the family, the sickness rate was 70 per thousand. When the income was $14 per individual in the home, the sickness rate dropped to 48.2 per thousand. When the income was $16 to $20 per person, the sickness rate dropped to 34.4 per thousand; and with an income of $20 or more per individual, the sickness rate dropped to 18.5 per thousand. Thus it appears that the health of the family is in a measure at least governed by the revenue of the home.

That the industrial physician occupies a strategic position in the solution of the intricate problem of poverty requires no elaboration. When we speak of poverty, we mean the condition in which is found a lack of some of the necessaries of life—the goods, materials, and service necessary for wholesome living. Energy is one of the most valuable assets of man, yet this cannot be had without wholesome living. Again it is obvious that sickness and poverty are intimately woven into the social fabric as cause and effect; consequently the effective solution of our social problems in the home rests in no small measure upon the foundation of the prevention of disease. Insufficient revenue means under-nutrition, improper housing, lowered resistance, increased susceptibility to disease, and, oftentimes, physically subnormal children.

It is not Utopian for the industrial physician to include within his purview the matter of infant welfare, prenatal care, etc., as these subjects are inextricably bound to the industrial future of the nation. In one industrial center of the country composed of mixed peoples, it was found that the infant death rate in the districts of better-housed American workmen was 90.6 per thousand births; in congested, foreign-born districts the rate was 141.2. An increase in infant mortality was noted with a fall in the earnings of the bread-winners. When the chief bread-winner's earnings amounted to $1,850, the infant death rate was 89.4; when the earnings were between $1,050 and $1,850, the rate increased to 127.1; and when the earnings fell below $1,050, the rate rose to 137.8.

I think it unquestionably proper for the industrial physician to make clear to his fellows the facts concerning therapeutic measures that have a bearing on the public health and are controlled to no little extent by political or legislative action.

One is moved to a sense of profound sympathy for persons who in this enlightened age adhere to the early inconclusive views surrounding the effects and value of vaccine and antitoxins administered for immunization and curative purposes. With the vast and preponderant evidence of experience to establish definitely levels of value, there is no longer rational ground for opposition. Antitoxins and vaccines are nature's own remedy. When one is at-

tacked by the germ of diphtheria, for example, one begins to develop antitoxin within the blood stream. But there is danger that the diphtheria germ may be developing its toxin faster than the victim is developing antitoxin; hence the necessity of reinforcing nature.

Diphtheria antitoxin is manufactured in a simple manner; a healthy and well-nourished horse is gradually and painlessly immunized with relatively small doses of diphtheria toxins which are progressively increased, producing a high degree of resistance, which means a plentiful supply of antitoxin. A small part of the horse's blood is then withdrawn and refined until only the fluid elements, or serum, remain. This serum is then standardized, placed in appropriate containers, and distributed for use. When required, the serum is injected beneath the skin of the patient, in small doses for prevention and in doses about ten times as large for the cure of the disease. More recently, it has become the practice to inject serum directly into the circulating blood stream by opening a superficial vein. This procedure serves to reinforce nature in her efforts to resist the disease, and, when administered early enough, so fortifies nature that danger is averted and the chance of recovery is tremendously enhanced.

In autocratic Germany before the war, by reason of strict enforcement of the vaccination laws smallpox was almost unknown. In the United States the disease is widely diffused; in some districts it is constantly prevalent, and from time to time a considerable number of cases appear in the larger cities, usually because of official laxity in the enforcement of the vaccination laws. In this country it is not uncommon for individuals and specifically organized groups to defy the law by resisting authorized health officials. The Anti-Vaccination Societies carry on a fanatical campaign of misrepresentation by citing falsified statistics, half-told experiences of discredited physicians, and unauthenticated cases, and by appealing to emotion, hysteria, and pathetic ignorance.

A discussion of immunization leads one naturally to a consideration of animal experimentation, a fundamental necessity in medical research, and suggests the relation of public opinion to scientific progress. If the anti-vaccinationists and the anti-vivisectionists could have their way, they would legislate against procedures which have saved and will save untold millions of human lives by making possible modern surgery and our present knowledge of such diseases as smallpox, tuberculosis, diphtheria, cerebrospinal meningitis, tetanus, puerperal fever, syphilis, rabies, bubonic plague, cholera, yellow fever and, more recently, diabetes.

The only protection which medical science and social welfare have lies in public opinion, which legislators clearly recognize, and the strength of which they are constantly alert to sense. If leaders of thought, educational institutions, the press and platform, and other disseminators of sound opinion, together with people who recognize and admit that two and two make four, would secure the facts, trust experts, and take a positive, militant stand based on conviction, the common welfare would be inestimably promoted. There is no serious doubt of the outcome, because, in spite of a noisy minority, informed public opinion is reliable and will ultimately prevail.

The conspicuous and immediate need of medicine is co-operation between the state with its subdivisions and the physician. How will this be accomplished?

If conditions are studied as they exist in Europe, the tendency appears to be toward so-called health legislation. In Germany it was believed that health legislation would lead to earlier recognition of disease and better care of the sick workman and his family. Injuries and disease were to be lessened in incidence and lost time was to be reduced, but the results were wholly disappointing. The scheme did not lead to better care for the sick. They were cared for as badly as before. Doctors who could not make a living in any other way were obtained largely to fill the places created. As there was a certain element of free choice of physicians by the beneficiary, the doctor had, of course, to please the patient in order to hold his post. The system led to malingering, which the honest physician could not check if he tried, and the result was that he lost his patients to an unscrupulous competitor. This form of dishonesty became so prevalent as to be a public scandal. Time lost from sickness was not reduced, but rather increased. The man with an injured finger, who could have been a part-time producer within a week, did nothing until his finger was entirely well. There was no general co-operation.

In England the same plan was in use with the same result. Patients who were previously treated by physicians without charge were treated as badly at the expense of the taxpayer. It is very evident that health insurance, which may be sound in theory, has omitted serious consideration of that mystifying factor—human nature.

The early organization of our hospitals shows a similar tendency. The model of American hospital organization had its origin in Europe. In the early days a hospital was a place where homeless persons and charity patients could go when sick. This ancient conception of hospitalization failed to anticipate modern requirements. The continuance of this outgrown practice resulted in denying hospital care to the honest, but poor, taxpayer, and we had the extraordinary spectacle of premium on inefficiency and laziness—special hospital privilege for the unproductive person who was a liability rather than an asset to the community. The worthless obtained all the benefits of modern practice which could be obtained by the average man at a cost which he probably was unable to bear.

I think I am in accord with W. J. Mayo who states, "I can never quite understand the point of view of a man who leaves a large amount of money for a charity hospital. The care of the poor and unfortunate is as much the duty of the community as sewer maintenance." The community will do only those things which its conditions require it to do. There is no more reason why a citizen should give money to relieve the taxpayer of this just burden, than there is for his assuming the cost of street paving, or any other public outlay. What he should do is to step in at the point where the public cannot or will not expend money, that is, to advance knowledge by research investigation work, which will prevent sickness and furnish better care for patients suffering from certain diseases, which require more study than is given in the average hospital controlled by political subdivisions.

If hospitals are to be a part of a plan of philanthropy, at least let their benefits be for all classes of the community, each person contributing a just proportion of the expense according to his means, thus advancing the cause of true Americanism in which each man is taught to be self-supporting and to pay for what he gets as far as his means permit rather than encouraging mendicancy.

There is one phase in the relationships of the industrial physician specifically covered by the code of ethics, to which I wish to draw your attention—namely, that which deprives the employer of the right to so-called privileged information regarding the physical condition of the employee. With this I am not in sympathy, for medical service in industry should function for the mutual benefit of the employer and the employee. There are, of course, certain confidences which must be held sacred, but when facts are disclosed that may affect the interest of the public, or the employer, or the fellow-workman, they must in all justice be made available to the proper authority in order to safeguard the interests of the many against the individual.

Medical practice in its preoccupation with the ailments of the patient has admittedly neglected the psychic and social factors, and has been utterly unmindful of the economics of disability. Thus it is that the practice of medicine is no longer the mere treatment of the sick body, but embraces also an understanding of material, mental, and environmental influences. We have chosen a field of broad responsibility, the preparation for which is found in no university curriculum and which can be successfully undertaken only after years of experience.

The future of the nation rests on the physical, mental and moral health of its units. National supremacy cannot exist without the solid, unwavering support of this triad. Cause, prevention, and result must engage our best thought, with a view to lengthening the life span, maintaining the human power necessary to do the world's work, and preserving mental integrity. The future presents an enchanting vista. A new freedom is available to this nation through medicine—freedom from the infections, from acquired diseases, from the charlatan, and from the menace of feeblemindedness. With open minds, courage, and a growing appreciation of all human values, let us face the days ahead ready to give to our people that service which it is our honorable pleasure to render.

THE RELATION OF INDUSTRIAL MEDICINE TO THE GENERAL PRACTICE*

HARRY MYERS, M.D.

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TEN or twelve years ago industrial medicine had really no definite status. The medical profession was inclined to look askance at it, and industry itself used it in a very primitive way. Now some of the best men in the profession are attracted to it, and industry generally recognizes it as good manufacturing policy, to the extent that large, well-equipped dispensaries are installed, with medical and nursing attendants in charge.

Every great movement starts with long swings of the pendulum, and it seems that it is inevitable that the pendulum must always swing too far. I feel that this has been true with industrial medicine. The work has been carried so far, in fact, that many concerns have had to curtail it most drastically, and some have had to discontinue it entirely. That such action has been necessary simply attests the fact that the medical service had reached the point where it was no longer good manufacturing procedure. I feel also that in some places the work has been carried to the extent that it is considered by some as a menace to the general medical profession, and this, of course, means failure in the end. In time industrial medicine will find its true place, and then it will exert its greatest usefulness. Of this I am convinced, that if the industrial physician in any way does otherwise than help preserve the integrity of the general medical profession, his work will in the end be of questionable value. For in the last analysis, industrial physicians constitute only a small part of that great body which represents medical science—namely, the medical profession.

In the manufacturing business we have certain attachments, certain moorings. In a financial way we look to our banking connections, for metals we connect with certain metal companies, for coal with certain coal companies, and so on through the list. We know that the more we use these connections the better is the relation established between them and us, and that it is better for us to use a certain few all the time than to use many only occasionally. Likewise in the business of living, everyone must have certain definite attachments. He should have established relations with a good grocer, a good clothier, a satisfactory bank, an agreeable place to work, a few personal friends, etc. For the sake of emphasis I have left one of the most important connections for the last—he must also have his doctor.

I have heard many arguments advanced to prove the ineffectiveness of the medical profession, as it operates in this country. We have many enthusiasts who wish to see a general reformation and to have us adopt certain types of governmental medical practice which are in vogue in various European countries. I have tried to follow these discussions from an unbiased viewpoint, but the only thought that I have to offer after long and earnest consideration is that the methods proposed offer no benefits to compare with those of the

* Read before the joint meeting of the American Association of Industrial Physicians and Surgeons and the National Safety Council, in Buffalo, Oct. 2, 1923. Received for publication Oct. 5, 1923.

procedure now established in this country.

We must in all fairness, however, be willing to recognize the frailties of our profession. We must be broad enough to admit that the medical profession is no better than any other group of men. Like all groups it has to contend with dark forces of weakness, selfishness, and ignorance, but of this we can be assured, its weakness is more than compensated for by its strength; its selfishness is far outweighed by its unselfishness; and its wisdom is much greater than its ignorance. Moreover—and this can be set down as an established fact—the general medical profession, with the support of various specialists, is the best instrument by which we can consistently deliver medical science to the people, and the industrial physician must recognize this. He must see that all that industry should do in a medical way is small in comparison with the work of the medical profession at large, and that he is only an assistant to medical endeavor as worked out by the general profession.

The longer I live and the more I work with people, the more I am convinced that nothing can take the place of the family physician, either in the profession or in the hearts of his patients. A short time ago I was discussing the general status of medicine with one of my over-organized friends. He pictured to me the growing tendency toward group medicine, toward industrial medicine, and toward state medicine, and the final disappearance of the family physician. His arguments told me in a most certain way that he really did not know people, for a basic knowledge of people themselves would have upset all of his arguments. Look over your own life, if you will, and you will see a few friends who stand out apart from all the rest; among these is your family physician. Indeed, if you take a census of those assembled at this meeting, you will be surprised to find how many took up the study of medicine in order to follow in the footsteps of their family physicians, so great was their personal influence. Let me ask you, "Can any type of organized effort divorce you from your friends? Can any organization, industrial, state or otherwise induce you to leave your trusty family physician?" The answer will always come back, "No, emphatically no!"

I think that we maintain a very good dispensary at The Ohio Brass Company. All of us who are associated with it are proud of the equipment, and we try to give good professional care and considerate service. Yet with all our facilities it is very rarely that a patient offers any objection when we suggest calling his family physician; in fact it is rarely that a patient does not prefer his own physician, in any type of serious accident or illness. It always gives me the keenest joy to see a man's faith in his own physician for I know that he has definitely worked out his attachment in this particular direction, and it is this attachment that will mean most to him throughout his life, more than industrial medicine could ever mean to him. I feel many times that physicians are so close to their work and to the profession that they lose sight of the intimate relation that exists between themselves and their patients. I am sure that it is easy to get so close to a thing that one cannot see it. Regain your judgment by trying to remember your notion of your own physician when you were a layman, and those of you who fear the effectiveness of state medicine or any type of organized medicine will find your fears vanishing.

Industrial medicine will find its greatest opportunity in helping to raise the

standard of health generally. If it sees this real opportunity it can perform a signal service to civilization. The elevation of any of our standards presents some very interesting phases. When labor-saving devices were first introduced, the labor unions said that because one machine was going to take the place of ten men the laboring man was about to be robbed of his very existence. They had failed miserably in their reasoning. They had not taken into consideration the following facts: namely, that by the use of machinery the products could be made so much more cheaply that more people could buy them; that the demand for these products would therefore be so much greater that the amount of labor would be increased; and that by the use of these products the whole standard of living would be raised.

By much the same type of reasoning, when medical inspection was introduced in the schools certain members of the profession entered a protest saying that it was robbing the doctor of some of his work. All who so argued soon found that the opposite was true, for the examiner aroused interest in health matters and called attention to many physical defects and many chronic diseases which had to be taken care of by the medical profession at large, and medical work instead of being curtailed was increased. This is exactly what happens in the well-regulated industrial dispensary. In fact, I know that I personally have referred much more work to the doctors of Mansfield than I have kept from them by taking care of certain acute ills and minor accidents at the plant.

But this is only one side of the question. It is also an established fact that anything that adds to a man's productivity benefits the world at large and particularly all those who have any relations with the man. One of the most important functions of the industrial physician is to help create a wholesome and agreeable place in which to work, by exercising such supervision of working conditions that the hazards of industrial disease are eliminated, and by installing proper safety devices to minimize the hazards of accidents. Statistics give us appalling figures for the time lost to workmen each year from sickness and accidents. This time represents not only loss of real money to every man involved, but also loss of real money to the world in diminished production. A plant dispensary enables the injured man to receive prompt and proper treatment for all minor accidents and many acute ills, and makes it possible for him in a few minutes to be back again on his job. No one can estimate the amount of time and money that is saved to the worker by these measures which make of him a better man, and which make of both him and his family more desirable patients when they consult their own physician. These are some of the indirect but nevertheless most important benefits that accrue to the general medical profession through the elevation of the general standard of health.

The subject of this discussion is "The Relation of Industrial Medicine to the General Practice." I have purposely used the word *relation* because it always presupposes a two-sided affair. Whatever blood relation I sustain to you, you of necessity sustain to me. If I am your brother, you are also my brother. A relation can never be a one-sided affair, and if general medicine has a right to expect certain relations with industrial medicine, surely the industrial physician has a right to expect certain things from the general physician. The recognition

of this principle is absolutely fundamental in all human relations. And what are some of the things industrial physicians can reasonably expect from the general physician? First, that he practise the fundamental teachings of the best medical thought, and that he use rational therapeutics instead of the irrational prescriptions so often sold by the commercial pharmaceutical houses and so often accepted by many members of the profession.

In his book, "Heart Affections and Their Treatment," Dr. MacKenzie in a most eloquent way gives us this warning:

> If the most enlightened members of our profession were to inquire into the grounds of their beliefs, even those most dearly cherished, how often would they be surprised to find on what fallacies their beliefs are based. Medicine is being evolved out of ages of tradition, and the bonds of tradition are difficult to shake off. It is not only the superstitious beliefs of by-gone ages that hamper us, but also the spirit of tradition which is ever present; for the tendency to believe without reason is ever recurring, while the reverence for authority makes us accept statements without proof.
>
> I could illustrate this in almost every field of medicine, but the most notorious example is to be found in our methods of treatment.

I know that every thoughtful physician believes that Dr. MacKenzie's warning is most urgent and I ask you, "Can the general practitioner expect support from the industrial physician if he gives a commercial prescription containing 1/2 grain of sodium salicylate for tonsillitis, or if a most irritating cough causing the patient to lose whole nights of sleep is treated with a nauseating cough syrup containing 1/64 grain of diacetyl morphine to the dose; if salves are used on infected fingers; and if infections are going to be scattered or brought to a head, as the case may be, by the use of flaxseed poultices." These are not hypothetical cases but are a few of the many therapeutic absurdities which have actually come under my observation recently.

The general practitioner should be most willing to co-operate with the industrial physician when he feels that he must advise his patient to give up a particular job. I was in the general practice for over five years. I knew what it was to be overworked, with little sleep, and to be profoundly tired, and I fear that more than once when I really did not know what was wrong with the patient, and yet felt that I had to say something, I asked him where he worked, and then without going into the subject to know what he really was doing, or under what conditions he was doing it, I thoughtlessly said, "Well, you must change your job." I am sure that I did not weigh my words. I am sure that I did not know what it meant to that man when I said that he should change his work. I did not realize that it meant severing his business relations which to him probably were the most vital ties in all the world. I am sure that if I had, I would have investigated his work to see for myself just what he was doing. If the plant had had a doctor, I know that I would have discussed the matter fully with him. I feel that this is of so great importance that I am forced to say, "No doctor has a right to give such advice unless he is willing to go to the plant and personally see just what his patient is doing and under what conditions he is doing it."

It is my firm conviction that this is the kind of relation that must exist between the industrial and the general physicians if both are going to exert their greatest usefulness: both must recognize their limitations; both must be willing to recognize the sphere of the

other. If they do, and if they are willing to obey the laws which are fundamental to all well-ordered human relations, they will see that they are not at war with each other but are allies in the truest sense.

PREVENTION, REHABILITATION, AND MEDICOLEGAL ASPECTS OF SPRAINED BACK*

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IN view of the abundant literature on the subject of diseases and injuries affecting the spinal column and contiguous tissues, this paper is limited to a practical consideration of the traumatic phases of sprained back with its multiple lesions as seen clinically in the rehabilitation and hospital clinics and workmen's compensation courts.

Physical rehabilitation of industrial workers by the state is a comparatively recent experiment. Morbidity statistics on the subject are either incomplete or entirely lacking. Steady progress is nevertheless being made, and information from various sources in the industrial and hospital field is gradually becoming more available.

Out of a series of several hundred so-called "labor backs" examined, the writer observed and followed to the initial surgical stage 456 actual sprained backs. The sprain-fracture cases among those involved in sprained backs have been previously reported by the writer in a paper on "End Results of 442 Fractures Caused by Industrial Accidents."[1] In the present report, spinal sprain fractures observed in this instance are advisedly classed as of sprained back.

After comparing notes on similar cases of the non-compensable variety from the clinics and records of the Long Island College Hospital, and the Hospital for the Ruptured and Crippled, New York City, the writer was singularly impressed with the idea that this group of patients, seeking nothing but relief from pain and suffering, is actually more disabled than the objective clinical symptoms observed during the usual examination would warrant. Occasional negative X-ray and laboratory findings often contribute to obscuring actual disability unless one is on one's guard and examinations are repeated.

IMPORTANCE OF PROGNOSIS

In the final analysis, prognosis is the main asset of a compensation-rehabilitation scheme designed to save industry millions of dollars and to return the injured workman to his proper earning status.

When the neurotic patient and the malingerer are eliminated the character of the prognosis in sprained back is all the more significant, as there are no safety appliances thus far devised to prevent it. In estimating disability in compensation and negligence cases, prognosis is of greater importance than diagnosis, even though the latter is indispensable.

ETIOLOGY

Etiologically, most back injuries are sustained in the course of gainful occu-

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[1]See Jour. Med. Soc., New Jersey, 1921, *18*, 115.

pation requiring heavy lifting, or are caused by sudden spinal hyperflexion as a result of direct or indirect force. The young robust person usually suffers no more pain than an acute spinal myositis—so-called strained back—would impose, in the course of several days' duration. When the accidental force is severe, the middle-aged worker whose back is thus involved is especially subject to complications and prolonged morbidity. Such workers are permanently incapacitated for their usual occupations, and their earning power is materially diminished. The problem becomes therefore more complex both medically and socially.

These patients are seldom operated on by the open method, and as such cases never come to the postmortem table, more intensive clinical study is the only alternative, and prevention a paramount issue. To that end research is now being directed by Professor Jaques C. Rushmore of the Orthopedic Department of the Long Island College Hospital Medical College. All the other departments are co-operating with him in this work.

It must be conceded that so-called rheumatic diathesis, syphilis, tuberculosis (1), gonorrhea, preexisting static weight-bearing deformity of the spine or lower extremities, or the ever-present focal infections are, singly or otherwise, contributory factors in cases of sprained back. These organic conditions must, however, be diagnosed and treated early, or the patients, innocently unaware of danger, will continue their work without apparent disability until an accident occurs, and then preventive medical measures are at an end.

Whether the physician is now dealing with a new lesion or with an old one aggravated by the alleged accident, liability is established in the presence of a corroborative history. The patient himself is the pathetic figure as in spite of compensation he is a chronic invalid with all the suffering and economic waste that such a condition entails.

Pathology

Muscle and ligamentous tissue tears, capillary hemorrhage, round cell infiltration, and serofibrinous exudate constitute the minute pathological changes in the acute, and fibrosis in the chronic conditions. It is difficult to imagine how the nerve filaments, especially the organs of Golgi at the tendon insertions, escape injury. The muscle bellies are never reported as completely torn, but the muscle tissue contraction is soon impaired reflexly, first by stasis and later by unabsorbable fibroplastic deposits within the muscle and muscle sheaths around tendo-periosteal attachments and intervertebral spaces. The subsequent calcification and osteophyte formation restrict spinal joint excursion rendering it more painful, as impaired muscle balance favors deformity.

The gross pathology of the later stage of back sprain, as evinced by laboratory and clinical findings, ultimately points to a chronic fibrosis and calcified deposits about the spinal column in the shape of excrescences or osteophytes.

Evaluation of the symptoms of fibrositis, fibromyositis and of periarthritis, with or without accompanying joint involvement, is not difficult (2).

Symptomatology

The painfully weak back, the reflex muscle spasm of superficial layers and the actual rigidity of lower muscle planes, the distorted statics of weight-bearing, the angle of compensatory deviation at the hips in the sitting

posture, the undue fatigue and the guarded gait and motions of the patients, who unconsciously seek hand or elbow support while sitting and lean while standing, are even more reliable signs than those entirely based on the degree of impaired spinal joint and muscle function. A forced mobile spine of this type is often debilitatingly painful, unlike a rigid poker back which is not half so fatiguing and is much less discomforting.

Diagnosis

In the cases observed, the following structures were apparently involved:

1. The musculotendinous segments of the Erector spinae group.
2. The tendo-periosteal attachments.
3. The ligaments and bone and joint tissue areas of the lower dorsal, lumbar and lumbo-sacro-iliac girdle.

The Latissimus dorsi was useful in evaluating tender points when the transverse, intertransverse, and interspinous muscle attachments were brought into play in the presence of a fracture of the spinous processes of the vertebrae. (This diagnostic feature is invaluable in the acute or subacute stages, if the patient is co-operating.) It was not unusual to note signs pointing to involvement of one or both sacro-iliacs, and the seldom mentioned and most often sprained lumbosacral articulation (3).

There was some difficulty in establishing a diagnosis in cases where tendo-periosteal tears and joint loosening were present, though unrevealed by the X-ray until some time later as a periosteal thickening with an occasional deposit of an osteophyte which could not be distinguished from those seen in chronic spinal arthritis unless similar deposits were also present higher up on the spine or elsewhere about joints.

The pathognomonic signs of acute lumbar myositis, the pain, disability, tenderness and weakness ascribed to spinal strain often becloud this affection unless a painstaking differential laboratory diagnosis is made. Physicians treating these cases are often misled. They are chagrined to find that such patients turn up in the compensation courts for formal hearing months after the accident, with corroborative diagnoses of sprain fractures of one or more transverse or spinous processes of the lumbar vertebrae, a chronic fibromyositis, and a fibrosis often extending to the perineurium of the sciatic nerve, and all the earmarks of tangible chronic disability.

These errors not only contribute to the undermining of self-supporting citizens, but they also have the psychic effect of promoting malingering while the employer and carrier are unduly penalized by having to defray expenses for long periods of temporary disability and for permanent partial or total disability. It is therefore strongly recommended that all these cases be treated as serious spinal injuries until every element of doubt is eliminated. Expert advice at this time is invaluable.

Before coming to court, the physician should consider the effect of ascribing to an apparent preexisting general or focal infection all there is to the case (4). He must keep in mind that a spinal arthritic is not necessarily disabled until along in years, and that the blood stream is constantly taking care of by-effects from focal infections except in cases where traumatism leads to the establishment of an area of diminished resistance and results in a fulminating lesion. The court usually ascribes such proven aggravation of a preexisting disease to the accident.

Luxation of the lumbosacral articulation usually is less evident physically and may be as undiscernible by the X-ray as that of the sacro-iliac synchondroses. This involvement of the lumbosacral articulation is often misjudged because of the normally varying shearing angle at the promontory of the sacrum in different subjects, unless it is recalled that the lumbosacral joint is so placed that at best it bears the bulk of the strain of the entire body weight before transmitting it to the sacro-iliac and hip joints by virtue of the spinal muscles (5). This mechanical consideration is corroborated by the often overlooked crush fractures of this region.

Preventive Measures

Employees for manual labor should be selected carefully. A painstaking examination of the individual with emphasis on an X-ray of the spinal column, both laterally and anteroposteriorly should be made (6). The individual should provide himself with a suitable pelvic or spinal girdle support. The loose features of the average support can be overcome by a special pad over the lumbosacral articulation so arranged as to fill the space over the latter and the hollow of the back (7).

Experiments conducted at the Long Island College Hospital seem to bear out the mechanical principle of relieving undue strain on the lumbosacral articulation by this special pad, which is equally useful as a preventive measure and as a supplement to curative measures. This adjustable pad and pocket arrangement tends to decrease the strain of the musculotendinous pull by diverting it to the pad, thereby conserving the integrity of tendon and ligamentous attachments in this vulnerable area.

Rehabilitation

Rehabilitation should begin immediately after the accident, and all patients with a definite history should be given the benefit of recumbent posture for at least five days, if possible, in an institution where laboratory facilities are at hand (8). At this time the ordinary myositis cases may become ambulatory with a daily treatment by massotherapy for another three or four days, and usual work may be resumed in ten days to three weeks with the aid of the protective girdle support (9).

In true sprain-back cases, however, the spine must be immobilized in a plaster of Paris jacket for fourteen days. The jacket may then be removed each day for a long enough period to allow treatment by physiotherapy. After this has continued for a month the jacket should be discarded and a permanent spinal support applied. At this time functional re-education holds out the best promise of minimal final disability.

In some of these cases electrotherapy was tried previous to the application of plaster of Paris jackets (7). A suitable electric modality has the effect of contracting the engorged tissues and forcing out the accumulated fluid, round cells, and other degenerative waste by way of the lymphatics. This electric treatment was preceded by thermotherapy, the alpine lamp or baker, a process that tends to relieve musculospasm and pain by dilating the capillaries.

The sedative type of electrotherapeutic modality, including diathermia, was successfully applied in the subacute and chronic stages of the last 100 cases treated at the Newark Rehabilitation Clinic (10).

If fracture is eliminated and a tendo-periosteal tear is suspected, the treat-

ment must be supplemented by a plaster of Paris jacket. Finally, functional re-education and vocational training suited to the patient should be pursued for two to three months. The patient may then gradually resume his work with the aid of a protective spinal support.

Whatever the outcome of the sprained back, the majority of these patients must have a suitable back support, since they are always subject to an unusual degree of fatigue (8).

Physiotherapeutic measures are of little value when the sprain untreated has reached the secondary surgical stage. Much more drastic surgical means must now be resorted to. In fact, these secondary stage cases were the only ones available when "State Rehabilitation" was first pioneered in the clinics of Newark and Jersey City in 1919, 1920, and 1921. It was at that time, while operating on the first 200 cases for correction of deformities, that the writer was especially impressed with possibilities of prevention in the initial surgical stage of all industrial injuries, especially those affecting the spine.

Fortunately, there are now definite signs of progress in the industrial field. Less than half of the patients applying for final awards require further physical rehabilitation, whereas 76.3 per cent. of the author's first 1,000 cases examined for the state of New Jersey were in need of such treatment, and 44.2 per cent. were fracture cases requiring further reconstruction.

Medicolegal Aspects

It may be kept in mind that in some states the physician's estimate of a patient's disability is based primarily upon impaired function in relation to earning power (vocational); in others, upon impaired function in relation to usual or general manual labor. Functional impairment of sprained back should, if possible, be calculated in physical units of tangibly impaired structures.

Pain, although a subjective sign, is an element of disability in sprained back, and provided neurosis, hysteria, and malingering are eliminated, cannot be disregarded in estimating compensation.

Much confusion can be avoided if the physician leans more to the medical and less to the legal aspect of estimating disability; but in the final analysis, in the words of the late New Jersey Commissioner of Labor, "The fact that a man is compelled to work when he is actually suffering pain as a result of an industrial injury to his back does not mean that he is able to work."

The estimate of functional disability must be viewed in the prognostic light of restoration of normal function, which clinical experience proves "possible." An estimate based upon clinical experience in cases of sprained back is quite different from an estimate on the basis of probability.

A hypothetical consideration is of value only when based upon actual experience of the medical witness or upon a description of the tangible lesion in relation to the symptoms in terms so simple that the average layman can understand them. Otherwise, it is usually discarded by the referee, at whose discretion the final award is allowed.

Conclusions

A sprained back points to a solution of tissue continuity by tearing of soft tissues, joint luxation, and occasional sprain fracture in the lower spinal and pelvic girdle region.

It is largely preventable in industry, through medical and mechanical means. The wearing of a pelvic girdle support to prevent "labor back" should be obligatory for all those engaged in manual labor.

Early diagnosis and treatment in the initial surgical stage is the only economical kind of rehabilitation. Sooner or later this must supplant all other physical means which experimentally precede the true or vocational rehabilitation of sprained back.

As a preventive as well as a curative measure, the element of fatigue should be guarded against by applying suitable lumbo-sacro-iliac supports while the patients are being treated and after they are discharged.

Prognosis is of great significance in the workmen's compensation or "negligence" cases of sprained back when they come up for final adjustment.

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FURTHER STUDIES IN MENTAL HYGIENE IN INDUSTRY: MALINGERING*

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IN a previous paper (1) I endeavored to discuss in a general, yet not entirely impractical, way the subject of mental hygiene in industry. In that paper I asserted that every physician practises mental hygiene and that his success as a physician depends more upon his use of psychotherapy than upon any other one factor; that the development of this branch of medicine as a science carries with it the obligation to practise it in a scientific way; and that when we learn to do so we will deliver an extremely hard blow to all quackery. The logical next step appeared to be a more thorough study of some one phase of the general subject, and malingering appealed to me as being one of the most important from the viewpoint of industry. Unfortunately for this study, my connection with industry was broken several months ago. Consequently, I have not had the opportunity to study in industry the wealth of material which would have been available had this not occurred. I will, however, offer some suggestions in the hope that they may be of value in stimulating someone else to carry forward the study of this important subject.

Malingering need not be defined to a group of industrial physicians and surgeons. Most of us are too familiar with the condition for our own comfort. In the past we have been in the habit of looking upon it as a very simple matter. A malingerer was an employee who had deliberately determined that he would simulate a disease or injury, or magnify an injury or its results, in order to enjoy a vacation at the company's expense. It never occurred to us that malingering was a disease and the malingerer, accordingly, was classed as a criminal in our minds and considered fair game for our efforts to circumvent his scheme. This is, of course, true with regard to real malingerers, but during the past few years the psychiatrists have come to believe that malingering in this sense is rather a rare disease. White (2) has stated that malingering is not a sufficient diagnosis. Dr. George H. Reeve, of Cleveland, in a personal conversation, told me that while there were, undoubtedly, malingerers in the army, the great majority of cases diagnosed as malingering proved to be hysteria. Rosanoff (3) states that "what some have described as . . . hysteria and others . . . malingering are one and the same thing." Other psychiatrists have similar opinions, and I am inclined to believe that in industry, also, many cases diagnosed as malingering are cases of hysteria.

It may appear that such a distinction is merely a useless play upon words. Despite the fact that Janet and others demonstrated some years ago the true nature of hysteria, many of us, lacking opportunities to keep in touch with the progress of psychiatry, may continue to

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look upon hysteria, also, as being a deliberate effort to deceive. This being true, it seems advisable to make an effort to understand the disease.

Janet (4) defines it as follows: "Hysteria is a form of mental depression characterized by the retraction of the field of personal consciousness and a tendency to the dissociation and emancipation of the systems of ideas and functions that constitute personality." Such a definition is not very helpful to those who, like myself, are not psychologists. The terms used in it are without meaning to a physician when confronted with a patient. I find the same difficulty with other definitions of the disease and with the descriptions of it as well. I will, therefore, describe hysteria as I have seen it, rather than attempt to follow the psychiatric type of description.

In making his complaint and describing his symptoms the hysterical patient usually exhibits considerable emotion. He appears to fear that the physician will not believe him, and makes every effort to impress upon him the importance and seriousness of his condition. The history frequently discloses the fact that other members of the family have exhibited signs of nervous instability. Invariably inquiry will show that the patient has failed to adjust himself to his environment and is unhappy as a result. This maladjustment may be in connection with his home life, his work, or his broader social relations. Hysterical attacks in girls are not infrequently the result of disagreements with friends or sweethearts. Very often, though not in every case, it will be discovered that some relative or friend has had similar symptoms in the past, or that for some other reason the patient has been led to think of the possibility of having such symptoms. Thus we now frequently see, as a result of the propaganda for cancer prevention, patients who complain of gastric or other symptoms which they think are due to cancer. In case of accident, the injury usually supplies this determinant. Suspicion of hysteria should be aroused by a history of numerous illnesses such as so-called sick headaches, severe dysmenorrhea which developed only after menstruation had been established for a year or two, vague stomach symptoms (according to Martinet 75 per cent. of all gastric diseases are neurotic), and fainting attacks. If such illnesses have been cured by procedures which could not reasonably be supposed to cure them had they been of an organic nature, hysteria is even more strongly suggested.

Physical examination, of course, reveals no organic cause for the symptoms presented. Sometimes this settles the diagnosis very promptly, but with all the advances in medical science it is not always possible to decide the matter so easily. It is often of value to test the suggestibility of the patient, since abnormal suggestibility is characteristic of hysteria. Symptoms which are not a part of the clinical picture of the organic condition simulated can be mentioned to the patient as being necessary to establish a diagnosis; in many cases the hysterical patient will produce them before the next visit. Sometimes this abnormal suggestibility is accidentally brought out when some diagnostic procedure with which the patient is unfamiliar is followed by the disappearance of symptoms. I recently learned of a patient whose symptoms disappeared when an X-ray was made. It must be remembered, however, that the abnormal suggestibility is only along lines which correspond with the pa-

tient's wishes, and that there is an abnormal resistance to the acceptance of ideas which run counter to them. The persuasion which would satisfy the mind of a normal person usually fails when directed toward the cure of hysteria.

Perhaps, by this time, you impatiently demand to know what this is if not deliberate simulation of disease. To understand the difference between the two we must consider the mental processes involved. A case which I recently treated will perhaps serve to make these processes clear.

W. G., a white, male college student, 24 years of age and unmarried, complained of stammering. His mother had been nervous for a number of years, and both she and his older sister suffered from frequent sick headaches. He admitted his inability to make friends, especially with girls, and was very unhappy at home. Stammering appeared when he was 12 years old, immediately after an attack of whooping cough. Both the appearance and the subjective sensations during the stammering resembled the gagging seen in severe pertussis, and it seemed likely, even when he first came for treatment, that the stammering was actually an imitation of such attacks. The marked suggestibility of this patient was shown one day when he partially hypnotized himself while giving associations to a dream. Physical examination was negative. The patient was asked to note occasions on which he stammered. When he thought these over, he found that each time he stammered there was some conflict between what he wanted to say and what he finally did say. For instance, one day he saw a man with whom he was very slightly acquainted riding on the same street car. He could think of no way to enter into conversation except by offering some peanuts which he had. When he offered them to the man he stammered badly. He admitted that he did not want to offer the peanuts because they were really his sister's, and he felt guilty for giving away what was not his. He resented, too, the fact that he was unable to think of any other way to enter conversation and blamed the other man for this. At the same time, he was annoyed at feeling this resentment. Each attack of stammering thus represented a considerable battle in his own mind between conflicting desires, and the period during which he could say nothing was that which had to elapse before he could get these conflicts settled and know what he was actually going to say.

But what connection had his pertussis with this mental state? He remembered that when he had had it he was not allowed to leave the yard. He naturally resented this, and, to make matters worse, his playmates in the next yard would dare him to go out, and would taunt him when he did not. At such times he had wanted to use profane language but was afraid to, since his parents would hear him. Because of this handicap, the other boys seemed to get the better of him, and he was indignant at the circumstances which kept him from using language which he felt would put him on a par with them. The shouting and excitement inevitably brought on an attack of coughing, which ended only when he vomited. This would stop the wordy onslaught of the boys and enable him to come out victorious after all, according to his twisted logic. Thus the attacks appeared to be of distinct advantage to him.

Comparison of this mental state with the one just described will show that they are very similar. In both cases the stammering or coughing served to pro-

tect the patient from saying things which he felt that he should not. The stuttering had also been of advantage in school by saving him from many recitations. It had enabled him as a boy to sell more papers because people felt sorry for him. It had saved him from immediate answers and had given him time to think of excuses when his parents had discovered him in some wrong doing. In every case, then, from the beginning of the trouble until he came for treatment he had used the stammering as a protective mechanism. By means of it he had taken an unfair advantage of his associates. His reason for so doing had been fear that he would be unable to meet trying situations as normal people do. He felt inferior to other people and was afraid that they would discover this fancied inferiority. Evidence of this was exhibited in the interesting circumstance that when playing quarterback on football teams he never stammered in giving signals. In those circumstances his superiority was established; for the time he was in supreme command of his universe.

So far one gets a picture which is far from that of an ideal man. Yet the patient was a rather high type. He was a good son, a bright, hard-working student who was making every effort to earn his own way through college and meeting with considerable success since, at the beginning of his junior year, he had about $1000. All things considered, he was rather a likable chap. The paradox can be understood only when it is realized that the patient was totally unconscious of the mental mechanism underlying the stammering from which he was consciously trying hard to free himself. In a very mild degree it was another case of Dr. Jekyll and Mr. Hyde, who, after all, are present in each of us to some degree. Proof that he was unconscious of this mechanism is evidenced in the fact that the stammering began to disappear rapidly as soon as we were able to explain the cause of it. At the end of ten sessions with him it occurred very rarely. No other form of treatment was necessary.

Now to apply the facts in this case to hysteria in general. Every hysterical manifestation represents an unconscious effort on the part of the patient to attain some object which he feels is unattainable by more direct methods. In other words, he strives to compensate for a fancied inferiority. As soon as he can be shown the true mechanism of such manifestations, they disappear. Frequently even this is unnecessary. A cure can often be made by admitting that the symptom is all that the patient thinks it is, and then stimulating him to go ahead and show his ability by succeeding in spite of this handicap. This course allows him to develop a feeling of superiority which compensates for the inferiority complex which is at the root of the trouble, since a moderate success in life despite such a handicap seems to mean as much as a greater success without it.

No doubt this explanation seems farfetched to some. Yet it is every bit as reasonable as, and rather more easily proven by experience with patients than Ehrlich's side-chain theory, on the basis of which he evolved the arsphenamine which we all accept as an invaluable addition to our therapeutic resources. Since we have to admit numerous failures in treating hysteria patients by other methods with a large resultant financial loss to industry, it would seem worth while at least to investigate this theory further.

Let us pass to more practical and definite details of prevention and treatment. As stated in Janet's definition,

hysteria is a form of mental depression. Happy people do not suffer from it. It is evidence of failure on the part of the individual to adjust himself to the demands of life. Prophylaxis, then, must depend upon searching out those who are dissatisfied, finding the cause of their dissatisfaction, and aiding as far as possible in remedying it. As stated above, the fault may lie either in the individual or in the environment or in both, and some investigation of both is usually necessary. The physician in industry has an unusual opportunity to know the conditions under which the individual works, and he has more or less opportunity in different plants to remedy bad conditions. He must usually depend upon a visiting nurse to investigate and report on home conditions, which he may be powerless to remedy. His greatest opportunity lies in treatment of the patient. In most cases the potential hysteric is such because he is failing to use the opportunities presented to live a fuller life. He can develop a hobby or skill in sports, or he can improve his philosophy of living if he will, and in many cases he will do these things if ordered to do so by a physician for the sake of his health.

In the treatment of hysteria the first essential is confidence in the physician. If this cannot be secured it is hopeless to continue treatment, and the patient should be referred to another physician. Then the case must be studied in order to determine, if possible, what the symptom represents, since it is always an ungratified wish of the patient. In industry it may be the desire for compensation, but frequently it is far more complex. The real underlying wish is likely to be for appreciation of his services, promotion, revenge on a foreman for what the patient considers injustices, sympathy from his fellow-workers or family, etc. The desire for revenge has been especially common in my experience, and it is essential that this emotion be relieved. In my earlier paper on this subject I described how this was done in a case where a patient had been injured when another employee pulled her chair away as she was sitting down. The employee at fault was properly reprimanded while the one injured was carefully examined and shown every courtesy within the power of the medical department.

Frequently the wishes underlying an hysteria are such that they cannot be gratified. They are incompatible with the demands of civilization. In such cases it is necessary to have some knowledge of the normal instincts of man and to trace the wish back to its basic instinct, after which it is usually possible to find a legitimate outlet for it in some other direction. For example, sexual desire and the desire to create are manifestations of the same instinct, and the former can be greatly lessened by absorption in creative work of any type in which the patient can become interested. Such a statement may seem ridiculous, but even as conservative a man as Osler (5) recognized the truth of it empirically, and most of us know that the person who has found work or a hobby into which he can throw himself whole-heartedly is not apt to be bothered by a sex neurosis. The two are incompatible.

Drug treatment of the symptoms of hysteria is useful. It should be kept in mind, however, that drugs never cure the condition. They help by suggestion and may, indeed, cure the symptom, but the focus of mental infection, if I may use such a phrase, remains. Religious healers and other quacks have, moreover, in many cases, more powerful

forms of suggestion to offer patients than has the physician with his drugs. If a doctor, therefore, has nothing better to offer than suggestion, he would seem to owe it to the patient to recommend some of the forms of quackery. Drugs often aid distinctly in securing the confidence of the patient, however, during the time when the source of the trouble is being sought and thus pave the way for the cure. Hygienic advice is valuable in a similar way.

Summary

Most cases diagnosed as malingering in the army proved to be hysteria on further study, and it seems probable that this is true in industry.

Hysteria is not a deliberate effort to deceive. A complicated mental mechanism underlies every case but the patient is never conscious of this mechanism, and the condition disappears rapidly as soon as he is made conscious of it.

"Find the cause and remove it," the ideal of all medicine and surgery, is as important in treating hysteria as it is in treating any other condition. It is usually possible to cure hysteria, and thus no excuse remains for failure to make the effort to do so.

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CAN SICK-BENEFIT ASSOCIATIONS PROFITABLY ENGAGE IN DISEASE PREVENTION WORK?*

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THERE are in this country literally hundreds of organizations of industrial employees for financial protection against protracted illness. They operate usually with the co-operation and oftentimes with the financial assistance of the corporation which employs their members. In many instances a majority, and sometimes a very large majority, of the employees of a company contribute to the fund for sickness insurance. The work of most of these associations consists of the collection of dues from the members, the investment of the funds, the investigation of sickness claims, and the payment of benefits in accordance with the constitution and by-laws of the society. In certain instances these associations have established reading rooms and clubs, operated employment bureaus, organized savings banks, and undertaken various activities of a social nature. But we do not hear of many organized and well-directed endeavors to eliminate the waste of effort and of money in paying out benefits for avoidable sickness and for preventable non-industrial accidents.

That certain factors in the working environment, the character of the work itself, the situation in the home, or conditions in the community may produce disease is undeniable. That certain industries are more hazardous to health than others, and that certain communities constitute a greater danger to health and life than others, needs no discussion.

Position from a Health Standpoint

The sick-benefit association of industrial employees occupies a unique position from the public health standpoint. It is to the financial advantage of these associations to prevent illness among their members, regardless of where the sickness had its origin. The employer is in a less advantageous position for improving health, because his motives for the improvement of hygienic conditions beyond the gates of his establishment, and sometimes even within his plant, are often viewed with suspicion. This fact deprives him of the needed co-operation of his employees and of others in the community. The industrial mutual association, however, representing as it does the employees, and assisted as it often is by the management, has a real opportunity for exercising a most effective influence for fruitful co-operation along public health lines. It is difficult to understand why this peculiarly favorable position of the industrial mutual society remains unexploited, and why the larger sick-benefit associations, especially those which could economically organize an effective preventive service, do not engage generously in activities for the preservation of the health of their members.

* Read before the joint meeting of the American Association of Industrial Physicians and Surgeons and the Health Service Section of the National Safety Council in Buffalo, Oct. 2, 1923. Received for publication Oct. 5, 1923.

Would Health Work Pay Dividends?

Industrial accident hazards have been greatly minimized in recent years. The achievements of the safety movement have been notable. As a business proposition it has been found better to organize for safety than to let things drift and pay unnecessary claims for industrial accidents. Generally speaking, illness is much more difficult to prevent than industrial accidents. Nevertheless, may not an opportunity for handsome profits to members of a sickness insurance organization exist in this hitherto unexploited field? It is not our desire to attempt to assert that this is so, but merely to raise the question, and to present what facts we can that bear upon the matter.

Mortality Postponed by Health Work of Insurance Companies

Deaths have been postponed and length of life correspondingly extended by the health conservation work of life insurance companies. The cost of preventing deaths, it is claimed, is much less than the amount of the claims which would have come in, had the deaths not been postponed. In 1909 the Metropolitan Life Insurance Company began a campaign to lengthen the lives of its industrial policyholders. In the years following 1909 the mortality experience of the company consistently improved, and the improvement has been much greater than in the Registration Area of the United States. According to the statement of the president of the company, the improvement of the company's mortality in 1920 over 1911, in excess of the improvement in the Registration Area at the comparable ages, 1 to 74, for the same years, constituted a saving of 23,910 lives and $4,700,000 in death claims.

The company's campaign to prolong life consists of education of policyholders in personal hygiene by distribution of specially prepared booklets and pamphlets to teach them the fundamentals of health and the prevention of disease; organization of a visiting nurse service to care for policyholders when ill, and incidentally to teach sanitation and hygiene; development of an Industrial Service Bureau to co-operate with employers of labor in securing better working and living conditions for their employees; and co-operation with health and other officials of states and cities to secure adequate legislation and appropriations for the conduct of constructive and progressive health work. Incidentally, the company prepares exhibits, makes sickness and sanitary surveys, carries on "clean-up" campaigns, and attempts to supplement the activities of social and civic agencies in the improvement of health in their respective communities. Would similar activities on the part of large employee sick-benefit associations affect the morbidity rates enough to make this work profitable in dollars to them?

Variation in Sickness Frequency Rates

In attempting to find an answer to this question it would be helpful to know the extent of variation that actually occurs in sickness frequency and severity rates. If we find that sickness frequency rates in all sick-benefit associations having an equal waiting period are about the same regardless of whether health work is carried on or not, then the opportunity for disease control must be admitted to be slight.

If, however, the actual frequency rates of different sick-benefit organizations having the same waiting period vary widely under different conditions, an opportunity for control is indicated.

For the past two or three years the Public Health Service has been receiving monthly reports from a group of twenty-seven sick-benefit associations each of which has a waiting period of seven days; that is, sick benefits begin with the eighth day of continuous disability. The associations represent several different industries and are scattered over the northern states from Maine to Illinois and Wisconsin. They all pay benefits for essentially the same list of illnesses, the venereal diseases and certain other conditions being uniformly excluded.

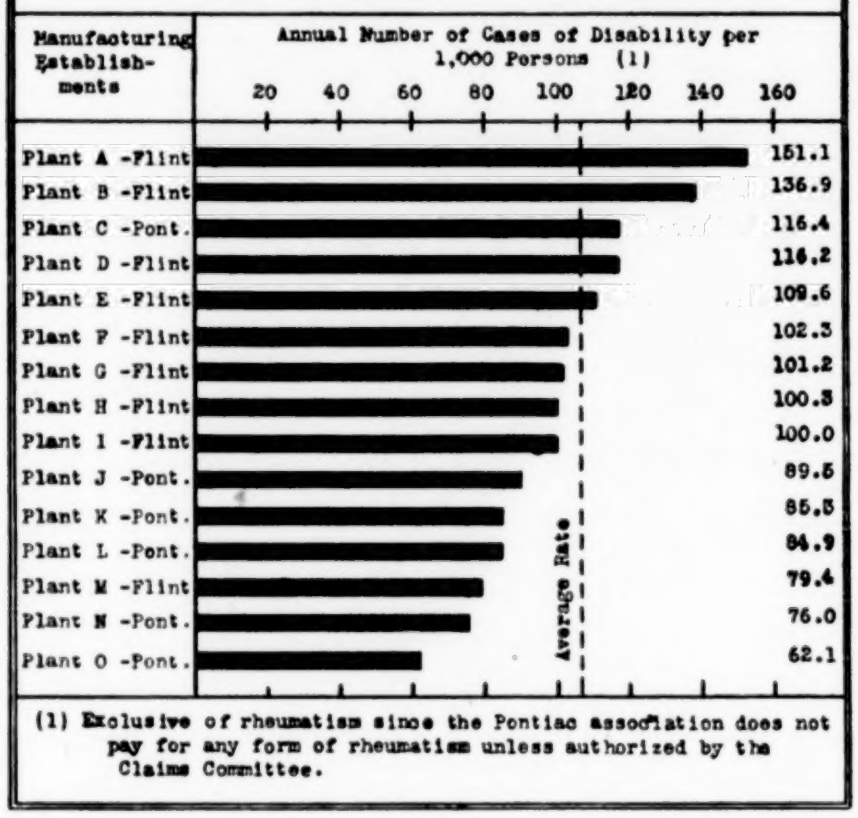
In 1921 the lowest sickness frequency rate in this group of twenty-seven associations was 48 cases per 1,000 persons; the highest was 349 cases per 1,000 persons. In 1922 the lowest rate was 56 cases per 1,000 persons; the highest rate was 568 per 1,000 persons. The variation is exceedingly wide. The association having the very high rate of 349 cases per 1,000 members in 1921, and 568 cases per 1,000 persons in 1922, however, probably should be excluded from the present consideration owing to certain unusual provisions which tend to exaggerate the real sickness rate. With this association eliminated and the next highest rate taken as the upper limit of the range in rates, we find a variation from 48 to 174 cases per 1,000 members in 1921, and from 56 to 213 cases per 1,000 members in 1922, or a range of 360 per cent. in 1921 and 380 per cent. in 1922.

There are, of course, a number of factors which might be expected to influence to a certain extent the indicated sickness rate of any fund. The sex and age composition of the membership of an association are factors to reckon with as well as the working conditions in the various establishments included and the sanitary situation in the homes and communities represented. Other considerations are the economic status of the members of the funds and of their families, the extent and efficiency of medical and hospital service provided by the establishments or by the funds, the specific regulations governing the payment of benefits other than those relating to the waiting period and to the duration of benefits, and the local practices that may affect the administration of the funds. The amount of the cash benefit paid by the different associations is also a matter which may influence the size of the indicated rate. Furthermore, the nationalities or racial stocks composing the membership of the different societies, marital status, especially if the proportion of married women is large in an association, and the extent of adjustment to the working environment as measured by the number of years in the company's service may all be factors of sufficient importance properly to be included in any sort of detailed morbidity study.

It would advance the purposes of the present inquiry if some of these factors could be eliminated through a knowledge of the extent of variation in sickness rates among different employee groups when they all work in the same industry, live in the same general locality, and are governed by the same policy of administration of the funds. Fortunately, there are now available the morbidity statistics of two sick-benefit associations which meet these requirements. In the city of Flint, Michigan, is an industrial mutual association with thousands

of members, representing the personnel of nearly all the large factories in the automobile industry located there. In the neighboring city of Pontiac is another sick-benefit association with a membership composed of employees of all the larger plants in that city, most of which manufacture either automobiles or automobile parts and accessories. The

FREQUENCY OF DISABILITY FROM SICKNESS AND NON-INDUSTRIAL ACCIDENTS LASTING SIX CONSECUTIVE WORKING DAYS OR LONGER, BY ESTABLISHMENTS IN THE FLINT AND PONTIAC ASSOCIATIONS DURING THE TWO YEARS ENDING DECEMBER 31, 1922. (1)



(1) Exclusive of rheumatism since the Pontiac association does not pay for any form of rheumatism unless authorized by the Claims Committee.

Pontiac association is a child of the Flint idea; the two organizations have almost identical constitutions and sets of by-laws. The managing secretary of the Pontiac association was trained in the Flint society. In short, the conditions generally in the two associations appear to be so much alike that it is believed that the sickness rates for the plants in Pontiac are comparable with the rates in Flint after deducting from the rates of both associations all cases of rheumatism, about which the rules of the two associations differ.

As shown in the accompanying graph, the highest sickness frequency rate in the two associations is 151 cases per 1,000 persons per year in Plant A at Flint, and the lowest sickness incidence rate is 62 cases per 1,000 persons per year in Plant O at Pontiac. The highest rate is thus nearly two and one-half times the magnitude of the lowest rate; to be exact, the range of variation is 243 per cent. These rates are on an annual basis, but they represent the morbidity experience of two years, the years 1921 and 1922. Being two-year averages, they should be more stable than figures for a single year.

Differences Due to Sex and Age

We need to know, of course, how much of the variation was due to differences in the sex and age composition of the membership of the various groups under consideration, for we have found from the tabulation of certain morbidity data that the frequency of cases of disability lasting one week or longer averages 50 per cent. more among women than among men, and that the frequency of sickness lasting a week or longer is more than twice as great among males in the age group 55 to 64 years inclusive as among men 25 to 34 years of age.

We can dismiss from consideration the question of the sex composition of the membership of the two associations for the reason that the proportion of women in either association is probably too small to affect appreciably the sickness rates of any fairly large group. The question of age composition is a little more difficult to deal with. It will be noticed that the higher sickness rates are found in the plants at Flint with a few exceptions, most of the Pontiac establishments appearing near the bottom of the array. The data from the Flint association were not available in such a way as to permit the computation of sickness rates according to age

groups, but the age of claimants was reported. By tabulating the sickness claims according to age groups it was found that there were more claims to the extent of 1 per cent. in the Flint association at ages 45 to 54 inclusive than in the Pontiac society, and 4 per cent. more claims at Flint in the age group 55 to 64 inclusive, thus suggesting that there were relatively a few more people in the Flint association above age 45 than in the Pontiac group. But these percentages are not large enough to suggest any very striking differences in the age composition of the two populations. It is possible, however, that in some establishments the age differences were more marked than this, and account to a certain extent for some of the differences in the rates. On the other hand, it is conceivable that an adjustment for age might even increase the present differences in the rates for some of the establishments. A plant having a relatively high proportion of employees in the older age groups might, on account of certain favorable circumstances, show a fairly low or even a very low sickness incidence rate. We should not assume that every difference in sickness rates will be diminished by adjusting for the age factor.

These statistics, therefore, afford the interesting proposition that even under conditions which are similar in many respects, the frequency of sickness may vary considerably. What, then, are the causes of these wide variations?

Opportunity for Health Work Indicated

It is unfortunate that we cannot proceed further with the analysis of the statistics of the Flint and Pontiac associations. If we had additional data we could measure the influence of each of the important factors affecting sickness; sex, age, nationality, occupation, department of the plant, number of years employed in the establishment, marital status, etc. Having evaluated the importance of each factor, we could adjust the rates in any given group for these several factors, and thus come to know some of the fundamental causes of the variations.

When all the factors not directly subject to control, such as sex, age, nationality, etc., have been taken into consideration, however, it would *seem* from the wide differences in the crude rates that there would still be considerable latitude for the effective operation of organized endeavor to preserve health and prevent disease. The range in rates, however, affords no very definite idea of the amount of possible pecuniary profit to a sick-benefit society which may carry on a campaign for the conservation of the health of its members. Associations doubtless would like to know what the actual possibilities are for profit.

Possibilities for Pecuniary Profit

Each association obviously constitutes a separate problem in this regard. The size of the association has to be considered. The cost of prevention doubtless would vary greatly, depending upon such circumstances as whether facilities for medical service along preventive lines are already available in the community or whether a new organization would have to be built from the ground up.

To take a specific problem, let us see what some of the possibilities for profit are in the Flint society. In the two years under consideration the average

number of calendar days of disability per case at Pontiac was 25.4 days. This figure includes the waiting period of 5 secular days. In the Flint association the average duration of cases was 34.6 days, or a difference of 9.2 calendar days per case in favor of Pontiac. If the handicap of a slightly older age distribution at Flint could be overcome by a closer follow-up of cases to see that every disabled member was being cared for so as to shorten as much as possible the duration of his incapacitation, and thus reduce the average duration of cases at Flint to the rate experienced by the Pontiac association, the saving in sickness benefits at the rate of $9 per week would amount to $22,448 per annum.[1] This saving does not contemplate the prevention of a single case; it is based entirely upon shortening the duration of disease, and doing that only to the extent experienced in the Pontiac association. Since there is no reason for assuming that the Pontiac rates represent the minimum in sickness duration, a saving considerably greater than that just indicated probably could be achieved.

The prevention of illness obviously is more difficult than the prevention of industrial accidents, for the causes are more perplexing, and oftentimes much more difficult to control even when they are known. But these surely are not valid reasons for giving up all attempts at finding a solution of the difficulties.

Diseases Which Cause the Most Disability

If, in addition to assisting the disabled member to obtain the right sort of care and treatment for his particular ailment, associations desire to go into the preventive side of health conservation work, what diseases and conditions should they attempt to prevent? Since this presentation is entirely from the point of view of cold dollars and cents and purposely excludes humanitarian motives and considerations, we shall say that the diseases to be prevented are those which cost the society the largest amount of money. From this standpoint an association should not devote too much time to the study and prevention of the contagious and infectious diseases such as smallpox, diphtheria, typhoid fever, measles, etc., because in non-epidemic years, judging by the experience of the Flint and Pontiac associations, these diseases cause only about 6 per cent. of the total cases and about 6 or 7 per cent. of the total number of disability days for which sick-benefits have to be paid. Neither is the prospect for handsome financial returns very alluring in the case of prevention of breakdowns of the circulatory system and diseases of the genito-urinary system and annexa, for in the Pontiac association these diseases taken together accounted for only 5 per cent. of the total cases and 7 per cent. of the total days of disability, and in the Flint association for 8 per cent. of the total cases and 11 per cent. of the total days lost. Nor would diseases of the nervous system and organs of special sense (eyes, ears) be the proper field for specialization, since this disease group was responsible for only about 5 per cent. of all the cases and for 5 per cent. of all the time lost. Similarly, diseases of the skin show about the same proportionate morbidity. Combine all these groups of diseases which have just been mentioned, and

[1]At the rate of $9 per week, 9.2 calendar days means $11.79 in sickness benefits. The average annual number of new cases at Flint, based on the experience of 1921 and 1922, is 1,904 which, when multiplied by $11.79, gives $22,448.16.

the sum of the time lost from them all is only 25 per cent. of the total number of disability days to be paid for.

But there was one disease group which caused 37 per cent. of the cases and 34 per cent. of the total disability days in the Pontiac organization, and was responsible for 38 per cent. of all the cases and 34 per cent. of the time lost in the Flint society; and another disease group accounted for about 20 per cent. of the expenditures for sickness benefits. These groups were the respiratory and digestive groups, respectively.[2] Combined, these ailments caused more than half of all the cases occurring, and more than 50 per cent. of the total days for which benefits were paid. On diseases of the respiratory and digestive systems it would therefore be profitable to concentrate preventive endeavor, unless it is found that they are much more difficult to control than other kinds of disease.

The specific diseases causing the largest number of days of disability per person in the Flint association are as follows: (1) influenza and grip; (2) bronchitis; (3) ulcer and other diseases of the stomach; (4) appendicitis; (5) tuberculosis of the lungs; (6) tonsillitis and other diseases of the pharynx; and (7) pneumonia. The experience of the Pontiac association was similar, though as much time was reported lost there from pleurisy as from pulmonary tuberculosis.

Benefits to Be Saved through Prevention

It is, of course, very difficult to estimate the number of cases of illness that can be prevented. In the present example, however, if the occurrence of cases among the members of the Flint association could be reduced to the rate of the Pontiac society, the benefits saved at the rate of $9 per week would amount to $12,528 annually.[3] This would be in addition to the saving of $22,448 calculated as possible through cutting down the duration of incapacitation to the rate experienced at Pontiac. The total saving in disability benefits to the Flint association would therefore be approximately $35,000 annually, on the assumption that preventive methods might be expected to overcome whatever handicaps exist at Flint over the Pontiac group, and achieve the lower illness frequency and severity rates of the Pontiac people. Against this sum, of course, would have to be charged the cost of the health conservation work.

The Vienna Plan

An undertaking of the sort suggested to prevent sickness is not altogether an untried experiment. Perhaps the reader is familiar with the plan in operation in the city of Vienna. Mr. Lee K. Frankel of the Metropolitan Life Insurance Company explained the Vienna plan to the Detroit Conference in 1913. According to Mr. Frankel's exposition of the plan, the various sickness associations in Vienna which are organized largely along occupational lines, a few years before the World War formed a central body in Vienna known as the

[2]The respiratory group includes influenza and grip, pulmonary tuberculosis, and diseases of the pharynx. The digestive group as considered here is the same as in the International List of the Causes of Sickness and Death except for the deduction of diseases of the pharynx.

[3]The difference in the frequency of cases in the two associations was 28.6 cases per 1,000 persons per year in favor of the Pontiac society. The average membership of the Flint association was 16,773 which, multiplied by the rate of 28.6, gives 480 cases at Flint in excess of the Pontiac rate. The average duration of benefits at Pontiac was 2.9 weeks which, at $9 per week, cost $26.10. A saving of 480 cases per year at $26.10 per case would mean $12,528 saved in sickness benefits.

Federation of Sickness Societies. To this federation was allotted the task of providing proper medical service which each constituent society paid for on a pro rata basis. Contracts with physicians and apothecaries were made by the federation, and specialists in medicine and surgery were engaged when their services were required. Every attempt was made to effect a cure at the earliest possible moment. The prophylactic and preventive side was developed, the federation employing for this work a competent student of conditions in industry. In its efforts to determine the extent of avoidable sickness, the federation made use of the statistical method. The diseases occurring in each establishment were tabulated and the rates studied in connection with data in regard to the hygienic conditions of places of employment. When correlation was found between high sickness rates in a given workshop and dust-laden air, poor ventilation, or other untoward conditions, the federation would send an inspector to check the statistical results, and if the investigation proved the correctness of the data previously obtained, the federation officials would tactfully approach the employer and call his attention to the deficiencies in his establishment. It is stated that the moral suasion which the federation brought to bear on manufacturers resulted in marked improvement in the conditions of their plants. The same method, it would seem, could be used to advantage in the improvement of community sanitation where conditions are shown by correct statistical evidence to be deleterious to health.

In our own country one of the most conspicuous examples of successful health work undertaken from the prevention point of view in an organization of this kind is the work of the Union Health Center established by the garment workers in New York City under the leadership of Dr. George M. Price.

Morbidity Statistics Needed

Before launching any health conservation campaign or program of disease prevention, the society for sickness insurance needs first of all the morbidity statistics that will define the problem and establish the goal. It is important to know what the sickness frequency and severity rates for any given group would be if the distribution of the membership in respect to sex, age, nationality, etc., were the same as in a standard population. In this way the extent to which the rates of an association are affected by these factors can be ascertained, and the illness experience of the membership compared with the sickness expectancy for persons of like sex, age, and nationality. As an example of such a procedure, several months ago the officials of a national sick-benefit association consulted the Public Health Service in regard to the morbidity rates of their society. It was found that their sickness frequency rate was nearly 100 per cent. higher than the average sickness frequency in a group of twenty-seven industrial mutual associations reporting to the Public Health Service, the waiting period of course being the same in all cases. The age distribution of the two groups was next investigated, and it was found that more older persons belonged to the sick-benefit association under study than ordinarily compose the membership of an industrial mutual association. Certain tabulations are now being made to find out how much of the 100 per cent. excess in sickness can be accounted for by the difference

in the age distribution of the two groups. If, after correcting for this factor, we still find a high sickness frequency, it is to be presumed that environment—either the working environment or conditions outside the working places—had something to do with the causation of the excess disability. When the officials of a beneficial association are armed and equipped with morbidity facts obtained in a correct statistical analysis, a powerful argument is afforded for the correction of conditions which are believed to be reacting unfavorably upon health.

The question of obtaining the necessary data for proper statistical analysis is not particularly difficult. The records of most sick-benefit associations would have to be modified only slightly to obtain all essential information, and the present or past records of many societies could easily be made use of for certain inquiries. The record of dues or the membership card usually shows the necessary "exposure" data from which to obtain the number of years of membership by sex, age, department, etc., and the record of "closed" claims usually includes a good share of the needed facts about each case. The main difficulty consists in getting the records analyzed by someone who has had experience in the analysis of morbidity records from the standpoint of health conservation.

But the sick-benefit associations in this country, except in a few rare instances, have undertaken neither statistical inquiry nor the prevention of disease to any great extent. It has not been considered a function of the industrial mutual association to investigate and attempt to eradicate the causes of any disease which might break out among the membership. That function has generally been deferred to the public health official and to the industrial hygienist. Could not greater effort and more thought on the part of all agencies concerned be expected, and therefore ultimately greater accomplishment, if associations for sickness insurance made it part of their business to investigate the incidence of disease and to study the conditions that affect the frequency and severity of illness?

Unfortunately, we have not many demonstrations of what can be accomplished by a program of this sort. It is in the nature of a venture to do it in a big way because the trail has not been thoroughly blazed. Imagination and boldness are essential qualities for the success of such an experiment. It is a sort of speculation in the field of public health. But, as the subject was expressed by the President of the British Medical Association when he recently appealed for better housing and living accommodations in order to reduce the high cost of sickness and disablement, "If we have not been afraid to speculate in adventure, in arms, in trade, and in business, why should we be afraid to speculate in health?"

EDITOR'S NOTE

Other papers which were read at the October meeting of the American Association of Industrial Physicians and Surgeons, together with all discussions to be reported, will appear in the January issue of THE JOURNAL.

BOOK REVIEWS

INDUSTRY AND HUMAN WELFARE. By *William L. Chenery*. Industrial Editor, "The Survey"; Editorial Writer, "The New York Globe." Cloth. Pp. 166 and introduction and index. New York: The Macmillan Company, 1922.

The object of this book is to present the major effects of the rise of the factory system upon the welfare of the American people. Following a vivid and interesting account of the condition of the American working population during the years prior to the establishment of the factory system in the United States, the author discusses the rise of industry and its effect on the worker and his family, wages, hours of labor, regularity of employment, and hazards of industry. A final chapter pictures the changing status of American workers during the period from 1790 to 1923.

The book—a small volume printed on good paper in a readable type—is written in a smooth, non-technical style and presents material well worth the attention of readers interested in the social problems of industrial progress.—*Katherine R. Drinker.*

PHYSIOTHERAPY TECHNIC. A MANUAL OF APPLIED PHYSICS. By *C. M. Sampson*, M. D., Formerly of the Physiotherapy Service, Walter Reed U. S. Army General Hospital, Washington, D. C.; Formerly Chief of Physiotherapy Service, U. S. Army General Hospital No. 9, Lakewood, N. J.; Formerly Chief of Physiotherapy Service, U. S. Army General Hospital No. 41, Fox Hills, Staten Island, N. Y., Later Hoff General Hospital; Formerly Reconstruction Officer, U. S. Public Health Service Hospital No. 61, Fox Hills, Staten Island, N. Y., Later U. S. Veterans' Bureau Hospital No. 61: Formerly in Charge Reconstruction, U. S. Public Health Service Hospital No. 70, New York City. Cloth. Pp. 443, with illustrations. St. Louis: C. V. Mosby Company, 1923.

This is a book upon a debated subject. The author makes that clear in his Dedication, Preface, and Introduction. He is an enthusiastic advocate of a type of therapy which has received grievous mishandling both from quacks and from untrained but well-intentioned members of the medical profession. Dr. Sampson's presentation of the subject is colloquial and strongly personal. He records successes and failures and is equally positive in both directions. Such a manner of presentation must in its turn engender positive opinions on the part of the reader. For example, in discussing the use of static electricity one finds such a sentence as, "This effluve will cut short an acute paroxysm of bronchial asthma in one or two minutes if played over the face, neck, and upper chest. It is only slightly curative but it certainly is palliative."

On the other hand in the chapter on actinotherapy there is the statement, "We understand that others, working in their own practice (and thus able to hold their diabetics when they find them) have had some measure of success in being able to treat these cases with ultraviolet ray, but we must confess that every case that we have tried to treat has reacted so unfavorably to the actinic ray that we were glad to cease the treatment."

The author is an excellent teacher. His descriptions of technic are vivid and he displays no hesitation over reducing essential matters in electrophysics to the level of his readers. He impresses one with his desire to utilize substantiating or explanatory laboratory data in discussions of the actions of the various agencies employed. In connection with the action of light and of X-ray the physiological reactions which occur have received much scientific attention and examination. It is possible to speak with some assurance as to the effects produced. When, however, one takes up questions of heat penetration, heat effects in deep seated organs, one is impressed by the frequency with which statements of opinion must take the place of actual knowledge. The field offers a certainty for profitable physiological exploration.

The book discusses first the general agencies employed in physiotherapy and the technic of their utilization. Then follow chapters giving the application of the various technics in selected conditions. Industrial physicians are preeminently in need of the type of help which Dr. Sampson offers. They will find much for reflection and encouragement in his book which it is a pleasure to commend and recommend.—*Cecil K. Drinker.*